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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PATRICK C. ST. GERMAIN, GERALD K. LANGRECK,
VERNON C. WICKMAN, and RYAN J. CARLSON

Appeal 2007-2788
Application 10/717,019
Technology Center 3600

Decided: April 22, 2008

Before MURRIEL E. CRAWFORD, JENNIFER D. BAHR, and JOSEPH A. FISCHETTI, *Administrative Patent Judges*.

BAHR, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Patrick C. St. Germain et al. (Appellants) appeal under 35 U.S.C. § 134 from the Examiner's decision rejecting claims 10-14, which are all of the pending claims. We have jurisdiction over this appeal under 35 U.S.C. § 6 (2002).

The Invention

Appellants' claimed invention is directed to a web tensioning device. Appellants' web tensioning device "provides an improved dancer arm and a controller therefor that responds readily to variations in web tension during web processing with minimal delay, and maintains web tension within predetermined limits without reliance on gravitational forces."¹

Claim 10, the only independent claim, reads as follows:

10. A web tensioning device which comprises:
 - a base;
 - an angular position sensor;
 - a dancer arm for engaging the web to be tensioned, having a free end portion with a dancer rotatably mounted thereon and a fixed end portion pivotably mounted to the base so as to coact with the angular position sensor and indicate relative angular displacement of the dancer arm as a web in contact with the dancer is maintained in tension;
 - a servo motor operably associated with the dancer arm for pivotally positioning the dancer arm by application of a compensating torque component in response to a control output signal; and
 - a controller for generating the control output signal in response to acceleration of the dancer arm due to changes in web tension as detected by the angular position sensor;

¹ Specification 1:23-26.

the applied compensating torque component being substantially the same as force of the dancer arm acceleration.

The Rejections

Appellants seek review of the Examiner's rejections under 35 U.S.C. § 103(a) of claims 10, 11, 13, and 14 as unpatentable over Cote (US 6,547,707 B2, issued April 15, 2003) in view of Rajala (US 5,659,229, issued August 19, 1997) and claim 12 as unpatentable over Cote in view of Rajala and Kawabata (US 6,024,319, issued February 15, 2000).

The Examiner provides reasoning in support of the rejections in the Answer (mailed November 28, 2006). Appellants present opposing arguments in the Appeal Brief (filed September 13, 2006) and Reply Brief (filed January 29, 2007). Appellants' representative presented oral argument on April 9, 2008.

THE ISSUE

The dispositive issue in this appeal is whether the combined teachings of either Cote and Rajala or Cote, Rajala, and Kawabata establish that it would have been obvious to a person of ordinary skill in the art at the time of Appellants' invention to modify Cote to provide a controller for generating a control output signal for a servo motor to apply a compensating torque component to the dancer arm in response to acceleration of the dancer arm as detected by a dancer arm angular position sensor, the compensating

torque being substantially the same as force of the dancer arm acceleration, as called for in independent claim 10.

FINDINGS OF FACT

The clear objective of Cote's device is to maintain a constant *strain*, rather than a constant tension, on the in feed web (col. 1, ll. 26-42). Cote's first processor stage 21 calculates web caliper (thickness of the web) from outputs RD and RP from web diameter sensor 5 and reel angular position sensor 6 (col. 3, ll. 9-14 and 44-52). The dancer roll 11 controls tension of the web 1 (col. 3, l. 21). Using the cross-sectional area A (caliper times web width) of the web, Cote's second processor stage 22 calculates the tension to be applied to the web so as to maintain the constant strain (col. 3, l. 65 to col. 4, l. 13). The tension signal is then converted into a force signal and then to a control signal to apply the appropriate force to rotate rocker arm 14, which supports dancer roll 11, to apply the proper tension to the web (fig. 1, col. 4, ll. 13-21). Cote does not generate a control output signal for a servo motor to apply a compensating torque component to the dancer arm in response to acceleration of the dancer arm as detected by a dancer arm angular position sensor, the compensating torque being substantially the same as force of the dancer arm acceleration, as called for in independent claim 10.

Rajala controls web tension by applying, via a servo motor, a net force T^*_{dancer} including a static force component having a relatively fixed value, responsive to the relatively fixed static components of the loading on the

dancer roll, i.e., the weight of the dancer roll and the target web tension (col. 9, l. 19; col. 10, ll. 30-33), and a dynamically active, variable force component, responsive to short-term tension disturbances in the web (col. 10, ll. 45-52). The controller determines the variable force component based on inputs from sensors for measuring dancer roll velocity, web velocity at and downstream of the dancer roll, and web tension upstream and downstream of the dancer roll (col. 9, ll. 12-43; col. 11, ll. 9-10). Rajala's controller does not calculate the variable force component to be substantially the same as force (mass times acceleration) of the dancer roll acceleration. Rajala does not maintain a constant strain on the web.

Kawabata utilizes a dancer roller 3 supported by an arm 4 to control web tension (fig. 1; col. 3, ll. 16-32). Kawabata's web tension control apparatus is provided with an arm elevation/depression angle detector 5 and a motor controller 6 (col. 3, ll. 63-65). The arm 4 is positioned at a preset angle to set the tension on the web (col. 4, l. 58-61). When the angle detector 5 detects that the arm 4 has rotated out of its preset position, the motor controller 6 sends a control signal to motor 12 to drive bobbin 11 either faster or slower to move the arm back to its preset position (col. 4, ll. 24-52). Kawabata does not maintain a constant strain on the web.

PRINCIPLES OF LAW

In rejecting claims under 35 U.S.C. § 103(a), the examiner bears the initial burden of establishing a *prima facie* case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). *See also In re Piasecki*, 745

F.2d 1468, 1472 (Fed. Cir. 1984). It is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d, 1071, 1073 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966), *viz.*, (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; and (3) the level of ordinary skill in the art. Additionally, in making a rejection under 35 U.S.C. § 103(a) on the basis of obviousness, the Examiner must provide some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. *KSR Int'l. Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007). Only if this initial burden is met does the burden of coming forward with evidence or argument shift to the appellant. *See Oetiker*, 977 F.2d at 1445. *See also Piasecki*, 745 F.2d at 1472. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. *See Oetiker*, 977 F.2d at 1445; *Piasecki*, 745 F.2d at 1472.

ANALYSIS

Cote's objective is to maintain a constant strain, not a constant tension, on the web. To achieve this objective, Cote calculates the cross-sectional area of the web, from the measured caliper and the width of the web, and then calculates the tension, and hence the force, required to effect the desired strain. Cote then converts this force signal to a control signal to alter the position of the dancer roll to apply the necessary tensioning force to the web. Cote is not interested in either the web tension *per se* or the dancer

roll position per se. Moreover, Cote affirmatively does not want to balance a compensating force with the force of the dancer arm (rocker arm 14) acceleration, as such compensation would thwart Cote's objective of adjusting dancer roll position, and hence web tension, to maintain a constant strain on the web, even with changes in web caliper. Therefore, a person of ordinary skill in the art would not have been prompted to modify Cote's strain control device to measure dancer roll position or dancer arm angle and to generate a control signal, in response to motion of the dancer arm as detected by the dancer roll position or dancer arm angular position sensor, for a motor to apply a compensating torque component to position the dancer roll or dancer arm to compensate for the detected motion of the dancer roll or dancer arm, as taught by Rajala and Kawabata.

Moreover, none of the applied references teaches applying a compensating torque component that is substantially the same as force of the dancer arm acceleration, as called for in claim 10. While the Examiner is correct that any motion of the dancer arm from a stationary position would necessarily involve acceleration (Answer 5), none of the references applied by the Examiner teaches applying a compensating torque component that is substantially the same as the force of the dancer arm due to that acceleration.

In light of the above, we conclude that the combined teachings of either Cote and Rajala or Cote, Rajala, and Kawabata are insufficient to establish a *prima facie* case that it would have been obvious to a person of ordinary skill in the art at the time of Appellants' invention to modify Cote to provide a controller for generating a control output signal for a servo

motor to apply a compensating torque component to the dancer arm in response to acceleration of the dancer arm as detected by a dancer arm angular position sensor, the compensating torque being substantially the same as force of the dancer arm acceleration, as called for in independent claim 10. Accordingly, the rejections of claims 10, 11, 13, and 14 as unpatentable over Cote in view of Rajala and claim 12 as unpatentable over Cote in view of Rajala and Kawabata cannot be sustained.

CONCLUSION

The decision of the Examiner to reject claims 10-14 is reversed.

REVERSED

JRG

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